Information and Communication Technology Enabled Education and Governance in the State of Kerala

Introduction

Several theorists and futurists have observed that society is undergoing a fundamental transformation from an industrial society to an information based society. This transformation can be appreciated by recalling similar transformation from an agrarian society to an industrial society during the previous century. The lessons of this earlier transformation were that an underlying technology, the steam engine, enabled the transformation and similarly the transformation to the information age is because of the enabling factor called 'Information and Communication Technology' (ICT) which is making revolutionary changes in the form of productivity gains and life style improvements.

ICT is one of the building blocks of modern society. It can enhance the competitive muscle of nations and can motivate public participation and greater democracy in decision making. It has a great potential in bringing the desired social change by enhancing access to people, services, information and can also create new opportunities for learning and acquiring new skills and competences that are necessary for education, employment, and training and for better participation in society. Thus ICT has enormous potential to increase productivity of almost all sectors, to overcome problems of dysfunctional administration, and to expand and improve the quality of services.

Objectives of the Study

Following are the primary objectives of the study.

- To review the various development models to identify the role of technology and human resources in development
- To assess the present status of information and communication technology enabled governance and education in the state of Kerala.

- To study the effectiveness of one of the ICT project, namely, *IT @ School*, implemented in the State, through a filed survey to explore the attitudes of teachers and students towards ICT enabled learning and teaching process in the Government High Schools.

The Study Area

The study considers information and communication technologies in general and focuses on the state of Kerala in the socio-economic development context. It is a theoretically oriented study and lays a strong base by identifying the various theories associated with development and particularly those theories which explain the relevance of technology and education in the development process. The study makes a detailed review of the current status and application of ICT in different areas. The study mainly concentrates on the role of ICT in education and governance. A review of the current status of the e-governance initiatives in the state of the Kerala has been undertaken by using secondary data. With regard to education, the study analyzes the diffusion of information and communication technology in education and its impact in the teaching – learning process in schools by examining the role of *IT @ School* project, a major ICT initiative of Government of Kerala. It examines the effectiveness of ICT enabled teaching and learning process from the stakeholders - teachers and students. The study evaluates the interacting factors of ICT in education and the barriers, which inhibits its effective application. Its effectiveness and acceptance is examined on the basis of important variables - clarity to concepts, learning process, motivation, organize ideas, communication, sharing, interaction, career prospects, confidence.

Hypothesis

Hypothesizes are set against each variables in the study with regard to the effectiveness of ICT enabled teaching and learning. Five hypothesizes are formed, both the students and teachers view point and examined through filed survey and its analysis.

Methodology

Methodology is the frame work that guides a researcher of any field of knowledge and in deciding whether to accept or reject certain propositions or hypothesis as part of the body of ordered knowledge or an individual discipline. In order to reach certain conclusion and findings to the study different research methods were used.

Approach

The study on ICT enabled education and governance falls under the purview of development economics. It examines the role of ICT aided learning and governance in the development context. Broad literature reviews, survey reports and seminal articles in related areas are used for the study. Primary data through structured questionnaires and surveys are conducted to collect data with regard to the various variables of ICT acceptance and its application in the field of education in the state of Kerala. Secondary data is primarily relied upon to examine the present status of e-governance in the state of Kerala.

Data Collection Methods

The survey instrument and scales are developed after an extensive review of literature and through other methods, in guidance with the theoretical base of the study. Pilot study conducted to establish its internal consistency and reliability. The universe selected for the study consists of the high school teachers and students of the Kerala State. Sample size calculation was conducted to fix the size to reach an inference on the research. Using power analysis based on the pilot study and sample size was fixed as 416 in the case of students and 307 in the case of teachers, with 5% degree of freedom (p value) and 90% power using *Sigma-plot.*

Convenient sampling method was used to gather data for the study by identifying three districts and three schools from each selected district. 450 students 360 teachers were identifies as respondents through convenient sampling technique.

Data Analysis

The data were analyzed via SPSS 20.0 for Windows. Descriptive statistics were used to describe and summarize the properties of data collected from the respondents. Parametric statistics like ANOVA and Z-test were conducted to analyze any differences between ICT enabled education and evaluation variables and other dependent variables. To determine the extent of relationship between ICT education and evaluation variables the mean % score $\left[=\frac{Mean\ Score \times 100}{Maximum\ possible\ score}\right]$ and one sample Z test was carried out. A level of 0.05 was established a priori for determining statistical significance. Pearson r correlation was used to measure the degree of the relationship between linear related variables.

Structural equation modeling (SEM) was performed to test the fit between the research model and the obtained data. This method was used because of its ability to examine a series of dependent relationships simultaneously, especially when there are direct and indirect effects among the various constructs within the model. AMOS 18.0 was used and the SEM estimation procedure is maximum likelihood estimation.

Findings of the Study

Following are the important findings of the study as per the data collected from the field survey.

- *There exists a linear relationship between ICT acceptance by students and the benefits of ICT use in education.*
- *The level of computer usage of students and the usage of ICT tools in class room have a clear influence on the level ICT acceptance by student community.*
- *Prior knowledge on computer usage has a significant influence on the use of ICT tools in class room, and its benefits*
- *The level of computer usage and use of ICT in class room is significantly high for boys than females.*
- *In the case of students, the study observed that there is locality and region wise differences in the case of computer usage, its use in class room, benefits emanating from ICT enabled learning etc.*

- *Students identified constraints to the effective use of ICT enabled class rooms - technical support, resources, time and effort, Curriculum restrictions, accessibility*
- *The analysis of the data has proved that basic computer literacy of teachers, significantly influences the ICT usage in class rooms.*
- *Socio-economic and demographic background of teachers has a significant role in the influencing the ICT enabled teaching and learning process*
- *Teachers identified constrains in the use of ICT in class room - teaching methods, technical support, resource cost and time*

Limitations

Limitations of the study include a rapidly changing amount of technical and market information, lack of available propriety information, and the necessity of providing confidentiality to background sources. The lack of time series and econometric data is hardly surprising in such a new and developing study area, but are limitations nonetheless.

Justification and relevance of the study

The study aims at explaining the information and communication technology, its uses, its strengths and weakness and also its application in various fields like education, governance, agriculture, health. The study made a detailed review of the role of ICT in all possible areas of its use for the making the governance more fruitful and effective. It has listed all the major ICT governance programs of the Kerala state. Many of these programs are new and highly useful, but they lack public patronage. This study is an effort in this direction. The study can help in substantiating the view that ICT enabled learning has a big impact on the way we learn and teach. It also identified the various constraints in the effective implementation of the ICT in education. So it can provide necessary inputs in the policy formulation exercises at the highest level. The study made an empirical review of the role of *'IT @ School'* project in overhauling the education scene of Kerala. An exhaustive review of the various development theories was also undertaken in the study. This will be a contribution to the body of knowledge and to the future researchers and learners. The study is a new area of knowledge to students of economics and there is enough possibility to expand its scope to analyze its impact in various other sectors since ICT is influencing every sphere of our life. So it opens a new horizon for research.

Conclusion

The significance of ICT is now a recurrent theme in the global economic literature. They are having an enabling role in the era of globalization, since it is a means for the compression and transgression of time and space. It has freed the economy of the constraints of distance and resource scarcity.